REMARKS

Favorable consideration and allowance of the claims of the present application are respectfully requested.

In the present Official Action, the Examiner rejects claims 1, 5-7, 9, 26 and 29-31 under 35 U.S.C. §103(a) as being unpatentable over US Patent Pub. No. 2002/0051427 ("Carvey") in view of "SP2 High Performance Switch Architecture" (Hot Interconnects II, 1994; Symposium Record)(hereinafter "Hot Interconnects").

Claims 22, 23 and 24 were further rejected under 35 U.S.C. 102(b) as being unpatentable over Hot Interconnects in view of US Patent No.6,101,181 ("Passint").

Claims 2, 3, 8, 27, 28 and 32 were rejected as allegedly unpatentable over Carvey in view of Hot Interconnects and in further view of Passint.

Claims 4, 10, 11, 14, 17, 18, 34, 36 and 39 were rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Carvey over Hot Interconnects in view of US Patent No. 7,173,912 ("Jaber").

Claims 12, 13 and 35 were rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Carvey as modified by Hot Interconnects and Jaber in further view of US Patent No. 7,185,077 ("O'Toole").

Claims 15 and 37 were rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Carvey as modified by Jaber in further view of US Patent Pub. No. 2002/0051427 ("Shin I").

Claims 16 and 38 were rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Carvey as modified by Hot Interconnects and Jaber in further view of US Patent No. 6,292,822 ("Hardwick").

Claim 19 was rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Carvey as modified by Hot Interconnects and Jaber in further view of Passint.

Lastly, Claims 20, 21 and 40, 41 were rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Carvey as modified by Hot Interconnects and Jaber in further view of US Patent Pub. No. 2003/0031127 ("Saleh").

With respect to the rejection of Claims 1, 5-7, 9, 26 and 29-31 under 35 U.S.C. §103(a) as being unpatentable over Carvey in view of Hot Interconnects, applicants respectfully disagree.

As a preliminary matter, Applicants have canceled Claims 1 and 5 and incorporated the subject matter thereof in amended Claim 6, now re-cast in independent form. Similarly, Applicants have canceled Claims 26 and 29 and incorporated the subject matter thereof in amended Claim 30, now re-cast in independent form. Claims 2, 4, 8, 10, 27, 32 and 34 are being amended to change their dependencies in view of the cancellation of Claims 1, 5, 26 and 29.

Respectfully, the deficiencies of Carvey had been articulated in applicants' prior response of October 25, 2007, incorporated by reference herein. Carvey concerns a one-hop data network, not a <u>one-bounce</u> data network. At best, Carvey teaches a 'one-hop' network appearing to comprise a plurality of nodes interconnected to each other via communication links, the network including a plurality of interconnected switch devices, the switch devices interconnected such that a message is communicated between any two switches passes over a single link from a source switch to a destination switch. Carvey further states at paragraph [0004] that the entire path can be computed b a fabric management microprocessor at the source node, which determines <u>the most efficient path</u> through the fabric (Emphasis added).

This is interpreted to mean that in the Carvey device, each packet takes the "shortest path" between source and destination.

Amended independent Claim 6 (and similarly amended Claim 30) now recite that the source switch concurrently sends a message to <u>a single arbitrary bounce switch</u> configured for sending the message to the destination switch <u>over a non-shortest path</u>. Respectfully, no new matter is being entered as the 1-bounce path implemented in the one-bounce data network of the invention does not pass over a single link from a source switch to a destination switch – unlike the prior art teaching of Carvey which only teaches use of a most efficient path (i.e., shortest path).

The Hot Interconnects teaching is of no help in this regard. The cited 8th slide in the Hot Interconnects teaching which shows a SP2 128-way switch having intermediate switch boards is a common prior art '2-hop network'. The SP2 switch of the cited slides is further described in Stunkel et al., "The SP2 High Performance Switch", IBM SYSTEMS JOURNAL, VOL 34, NO 2, 1995, http://www.research.ibm.com/journal/sj/342/stunkel.pdf which reference is attached hereto for the Examiner's convenience and which is being concurrently filed in an Information Disclosure Statement. As typical in this prior art, i.e., as in Stunkel and in Carvey, each packet takes the shortest path between source and destination. In other words, each packet takes the path that minimizes the number of hops between the source and destination. Between a given source and given destination, there may be multiple alternative paths that offer the same shortest distance. Neither Stunkel nor Carvey mention using non-shortest paths to improve efficiency of some communication patterns.

More particularly, the Stunkel reference ("The SP2 High Performance Switch", IBM SYSTEMS JOURNAL, VOL 34, NO 2, 1995,) at p.201, section 'Route Generation' describes that the SP2 routing algorithm, RTG (Route Table Generator), calculates the routes required

for node-to-node communication over the SP switch network. The RTG is based on an older existing IBM SP1 routing algorithm that provides a single shortest path between each pair of processor nodes. The shortest path approach corresponds to traveling from a source to a "least common ancestor" and back to the destination, as described in the earlier section on SP system topology...

The Stunkel reference also states that the RTG (Route Table Generator) "...selects routes only from (deadlock free) shortest paths. Shortest paths minimize the resources used by packets, reducing network congestion."

Thus in Stunkel (Hot Interconnects) and Carvey, each packet takes the shortest path between source and destination, i.e., each packet takes the path that minimizes the number of hops between the source and destination.

In contrast, in the 'One-Bounce Network', some messages take the shortest path, while other messages do not. The shortest path is the 1-hop path directly from source switch to destination switch. The other path is the 2-hop path from source switch to bounce-switch to destination switch. As described in detail in the application, for some communication patterns, it is ineffective to have all messages take the shortest path. For example paragraph [0027]. In other words, it is far more effective to have some messages take the longer path through a bounce switch, i.e., a <u>non-shortest path</u>.

Neither Stunkel nor Carvey mention using non-shortest paths to improve efficiency of some communication patterns.

Regarding amended independent Claim 6 incorporating Claims 1 and 5 and amended independent Claim 30 incorporating Claims 26 and 29, as demonstrated above, Carvey and Hot Interconnects do not teach the concept of bounce, since they do not have concept of non-shortest path. Carvey and Stunkel thus do not have concept of restricting to a single bounce.

Rather, in the present invention, the restriction to a single bounce is required, since more than one bounce decreases the efficiency of communication patterns.

Regarding claims 6 and 30, while the Office Action alleges that Carvey and Hot Interconnects teach the limitations for claim 5 and 29, Carvey teaches in Paragraph [0103] and Fig 11A that the packet is received by the Traffic Manager, which appends a fabric header to the packet specifying each hop through the fabric to the packet destination as well as a hop count (a bounce bit in a packet header that is reset). The hop count indicates the relative number of hops remaining to a binding node that allows packets to transition into the target egress based virtual network. However, like all of Carvey, the above excerpt describes shortest path routing. Carvey uses a hop count to determine if the packet has arrived at its destination. Since Carvey only describes shortest paths, he does not describe a bounce path. As described in the present application and in the remarks herein above, a bounce path is not a shortest path through the network.

In sum, applicants submit that new amended independent Claims 6 and amended independent Claim 30 are not anticipated by Carvey and Hot Interconnects and the Examiner is respectfully requested to withdraw all of the rejections of these claims and dependent Claims 2-4, 7-21, 27-28, 31-41 either directly or indirectly dependent therefrom.

With respect to the rejection of independent Claims 22, 23 and 24, independent Claim 22 directed to a 2-level one-bounce network having 64 nodes of a level is being amended herein to set forth the limitations directed to one-bounce action over a <u>non-shortest path</u> as now claimed in amended Claims 6 and 30, to wit:

> <u>said nodes of said one-bounce network level comprising a switch device, and said network switch devices interconnected such that a message communicated between any two switches passes over a single link from a source switch to a destination switch; and, the source switch concurrently sends a message to a single arbitrary bounce switch configured for sending the message to the destination switch over a non-shortest path, wherein,</u>

the network is packet-based, a packet being communicated including means for indicating whether a packet has already bounced or not, the indicating means comprising a bounce bit in a packet header that is reset when the packet is injected into the network and is set when the packet is bounced to a single arbitrary bounce switch, a set bounce bit indicating that the packet can only go to the destination switch over said non-shortest path.

Hot Interconnects and Passint, taken alone or in combination, do not teach such a two-level one-bounce network and the Examiner is respectfully requested to withdraw the rejection of Claims 22-24.

With respect to the rejection of independent Claim 25, independent Claim 25 directed to a distributed-memory computer configured as a multi-level binary one-bounce network comprising L levels is also being amended herein to set forth the limitations directed to one-bounce action over a non-shortest path as now claimed in amended Claims 6 and 30, to wit:

said one-bounce network level comprising a plurality of nodes interconnected to each other via communication links, the network including a plurality of interconnected switch devices, said switch devices interconnected such that a message is communicated between any two switches passes over a single link from a source switch to a destination switch; and, the source switch concurrently sends a message to a single arbitrary bounce switch configured for sending the message to the destination switch over a non-shortest path, wherein, the network is packet-based, a packet being communicated including means for indicating whether a packet has already bounced or not, the indicating means comprising a bounce bit in a packet header that is reset when the packet is injected into the network and is set when the packet is bounced to a single arbitrary bounce switch, a set bounce bit indicating that the packet can only go to the destination switch over said non-shortest path

Applicants respectfully submit again that Hot Interconnects and Passint, whether taken alone or in combination, do not teach such a multi-level binary one-bounce network and the Examiner is respectfully requested to withdraw the rejection of Claim 25.

In view of the foregoing, this application is now believed to be in condition for allowance, and a Notice of Allowance is respectfully requested. If the Examiner believes a telephone conference might expedite prosecution of this case, it is respectfully requested that he call applicant's attorney at (516) 742-4343.

Respectfully submitted,

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